

usually occur in bundles, each crystal, like a thin needle, being very slender, long, and pointed at the ends. Unlike sphæraphides, the bundles of raphides are easily broken up, so that these crystals are most readily seen swimming freely and separately in the field of vision, though it is often difficult, if not impossible, to see on them any sharp edges or flat faces. But sometimes the crystals are larger and their shape very obvious, of which instances occur in some Liliaceæ (as *Yucca*) and in most Iridaceæ. These crystals are regular prisms, that is to say, with three parallel angles and faces, so that a transverse section thereof would be an equilateral triangle. They are also very long in proportion to their thickness, yet comparatively thicker than the acicular forms; and their ends are either abrupt or sharply pointed. Besides, these crystal prisms generally, if not regularly, appear either singly or in pairs, and are with difficulty detached from the tissue of the leaf in which they are imbedded, thus differing remarkably from the more slender fasciculated raphides. When we do succeed in getting the crystal prisms to float freely in the field of vision, they are seen to be beautiful objects; and it is probable that they might prove useful in experiments on the refraction, polarization, and decomposition of light. I have chiefly examined them in Iridaceæ, in which order they occur abundantly, as may be well seen in different species of *Iris*, *Trichonema*, *Crocus*, and *Gladiolus*. In the leaves of the common and showy cottage favourite with large blue or purple flowers (*Iris germanica*?), the crystal prisms are quite as distinct as in any of the British plants; so that even humble town gardens may afford subjects for observations on these prisms when the more fugitive leaves of other genera of the order have disappeared.

Edenbridge, August 6, 1863.

PROCEEDINGS OF LEARNED SOCIETIES.

ZOOLOGICAL SOCIETY.

Jan. 13, 1863.—George Busk, Esq., F.R.S., in the Chair.

CONTRIBUTIONS TO THE KNOWLEDGE OF THE BRITISH CHARRS. PART II. BY ALBERT GÜNTHER, M.A., PH.D., M.D., F.Z.S.

Since the publication of my first paper on this peculiar group of *Salmonidæ**, I have received very valuable materials for prosecuting my researches. The additional specimens show that I have been correct in distinguishing the three British species from those of the Continent and from one another, and that the differences between

* 'Annals,' Sept. 1862, p. 228.

the young and mature fish of one species may be apparently greater than between individuals of the same age but of two distinct species—the laws according to which the changes in the external form proceed from the young to the mature age appearing to be the same in the different species, as far as our present experience goes. It has been observed, in allied species of insects, that, whilst the perfect animals are so completely alike as to be scarcely distinguishable, their larvæ are very different in their external characters, and even in their habits. This is not the case with the Charrs: the young individuals of two species differ as much from each other as the old ones. But in order to find out the distinctive characters of two species, it is always necessary to compare specimens of the same age. This can be ascertained by the examination of the generative organs, by the development of the jaws, and finally by comparison of a series of examples from the same locality, assisted by actual observation or information from persons who have been for years acquainted with the Charrs of a certain locality, and know to what size they attain there.

Among mammals and birds, difference in the size of full-grown animals is admitted as a specific character, whilst ichthyologists have scarcely ever used it as a distinction between closely allied species, because numerous fishes continue to grow for an almost indefinite period after they have attained to maturity. However, if we should be able to ascertain for a series of fishes the age or the size at which they *first* attain to maturity, the differences observed might be of as great value for the distinction of the species of fishes as in the higher classes of vertebrate animals. I have been induced to make these remarks by the fact (to which we shall recur in the progress of this paper) that the *Salmo alpinus* of Scotland attains maturity at a size inferior to that of an immature Swedish *Salmo alpinus*. Now, if such a difference in the size should be considered as a specific character at a future time, the Scotch and Swedish fishes would be separated.

The specimens which I have examined since the publication of the first paper are the following; they have been deposited in the Collection of the British Museum :—

a. *Salmo Salvelinus* (L.), Nilss.

Diagnosis, taken from a male specimen from the Lake of Wettern, 17 inches long.—Body slightly compressed and elongate, its greatest depth being contained five times and a half in the total length (to the end of the middle caudal rays). The length of the head exceeds the height of the body, being contained four times and a half in the total; it is rather more than one-half of the distance between the snout and the vertical from the origin of the dorsal fin. The maxillary extends beyond the orbit in the adult fish. Eye rather small, its diameter being less than one-half of the interorbital space. The length of the pectoral fin of the mature fish is equal to, or less than, one-half of the distance of its base from the root of the ventral. Dorsal rays fourteen*; the length of its longest ray is much less than that of the pectoral, and not much more than one-half of the

* Including the rudimentary rays in front of the fin.

length of the head ; the length of its base is twice that of its last ray. 190 transverse series of scales above the lateral line. Vertebrae 65. Teeth of moderate size.

This species is not represented by any of the British Charrs that I have examined. The Irish Charrs form quite a distinct group, the characters of which I shall point out hereafter. *S. Willughbii* and *S. cambricus* have larger scales, much longer pectoral fins, and differ besides in many other points. *S. alpinus* has the same number of scales ; but in specimens of a corresponding age and size the pectorals are much longer, the maxillary is less developed, &c. The Iceland Charr has the dorsal fin much more elevated. This Swedish *S. Salvelinus* may be identical with a part of the specimens comprised by Heckel under the same name.

b. *Salmo alpinus*, L.

Diagnosis.—Body slightly compressed and elongate, its greatest depth being one-fifth or one-sixth of the total length (to the end of the middle caudal rays). The length of the head equals the height of the body in mature specimens, but is somewhat more in immature ; it is two-ninths or one-fifth of the total ; it is rather less than, or equal to, one-half of the distance between the snout and the vertical from the origin of the dorsal fin. The maxillary extends but little beyond the orbit in the fully adult fish. The eye is one-half, or rather less than one-half, of the width of the interorbital space. The length of the pectoral of the mature fish is more than one-half of the distance of its base from the root of the ventral ; in immature specimens its length is considerably less. Dorsal rays thirteen ; the length of the longest ray is much less than that of the pectoral, and three-fifths or one-half of the length of the head ; the length of its last ray is a little more than one-half or two-thirds of the length of its base. 195–200 transverse series of scales above the lateral line. Vertebrae 62 in the Scandinavian variety, and 59 in the Scottish. Teeth of moderate size.

At the time when I first compared the Charrs of Windermere and Llanberis* with Linné's and Nilsson's descriptions of *Salmo alpinus*, I had not had the opportunity of examining specimens from Lapland. Now, having specimens before me which, in all probability, are identical with the species described by Linnæus and Nilsson, I see that I have misunderstood a part of the description of the former, and that the latter has given his notes from young specimens. When Linnæus says that the head of his specimen (12 inches long) was $1\frac{1}{2}$ inch, he measured only the top of the head from the end of the snout to the occiput ; whilst ichthyologists of the present time take the lateral length of the head from the end of the snout to the gill-opening. Nilsson says that *S. alpinus* has shorter pectoral fins than *S. Salvelinus* ; this is correct if we examine specimens of the former only 8–10 inches long, but in a mature state *S. alpinus* has the longer pectorals. Therefore the characters by which I have formerly distinguished the *S. alpinus* from *S. Willughbii* and *S. cambricus*

* 'Annals,' Sept. 1862, p. 230.

cannot be retained, whilst others, affording easy specific distinctions, become evident on comparison of actual specimens. The two British species mentioned have a less number of transverse series of scales; *S. Willughbii*, besides, has the body more elevated, whilst *S. cambricus* has a longer head, and the base of the pectoral overlapped by the gill-cover apparatus. The Iceland Charr, again, differs from *S. alpinus* in its elevated dorsal fin.

I have mentioned above that I refer to this species a number of specimens from Lapland, Scotland, and from the Orkneys. After having hesitated for a long time, I prefer doing so, as they certainly are more closely allied to one another than to any of the other forms. Future observations on a more perfect series than that which I have at present, and especially an examination of a greater number of immature and of very old specimens, will settle this point. The specimens from Scotland and Lapland appear to agree in almost every point of importance, but in the number of vertebræ and in the size: whilst the Lap Charr does not attain to maturity before it has attained to a length of 12–13 inches, the Scotch individuals are mature at a size of 9 inches. The specimens from the Orkney Islands are 6 inches long, and apparently correspond in age to a Lap specimen of 10 inches in length. The immature state of *S. alpinus* of both countries is distinguished by short pectoral fins; but, whilst those fins have attained to their full relative length in Scotch specimens of 9 inches in length, the Lap specimens are 13 inches long at the same period. Other differences may be observed on comparing these young Charrs, especially in the form of the head, which is considerably less elongate in the Scotch individuals; but in order to ascertain whether this character is constant, it would be necessary to compare a greater number of specimens than I have at present.

I shall first describe one of the mature specimens sent by Mr. Wheelwright from Quickjock.

Description of a male specimen, length 13 inches 8 lines.—Head and body compressed, but slightly elevated; its greatest depth is below the origin of the dorsal fin, where it is *one-fifth* of the total length (to the end of the middle caudal rays). The least depth of the tail is rather less than the length of the base of the dorsal fin. The height of the head above the mandibular joint equals the distance between the posterior margin of the orbit and the end of the operculum. The top of the profile of the head is somewhat elevated above the margin of the orbit, the diameter of which is nearly one-sixth of the length of the head, two-thirds of the extent of the snout, and rather less than one-half of the width of the interorbital space; the latter is convex, with a rather prominent ridge along the middle, and with a pair of series of pores. Snout compressed, conical, with the jaws equal anteriorly. The *maxillary* extends to the vertical from the hind margin of the orbit; in the two largest specimens (15–17 inches long) it reaches slightly beyond that vertical. It is armed with 20–22 *teeth* of moderate size; six teeth in each intermaxillary, fifteen in each mandible; three pairs on the vomer, arranged in two longitudinal series slightly converging behind; nine-

teen on each palatine bone, and six pairs on the tongue. *Operculum* obtusely rounded behind, its length being two-thirds of its height; the suboperculum projects but little beyond the hind margin of the opercle, its vertical width being one-half of that of the operculum.

D. 13. A. 12. P. 13. V. 10.

The origin of the dorsal fin is a little nearer to the end of the snout than to the root of the caudal; *the length of its base is one-third more than that of its last ray, and contained once and a fourth in that of the fourth ray.* The fifth and sixth rays form an acute point, and the upper margin of the fin is straight. The first ray is rudimentary, the second half the length of the third, the third two-fifths the length of the fourth, the fifth simple, the sixth branched, the last split to the base. The distance of the adipous fin from the dorsal is but little more than twice the base of the latter.

The origin of the anal fin is exactly in the middle between the root of the caudal and that of the outer ventral ray; the length of its base is somewhat less than that of the dorsal, and is contained once and a fourth in the length of the fifth ray.

Caudal fin forked, one of the middle rays being two-fifths as long as the outer ones, the length of which is contained six times and a half in the total; lobes pointed.

The base of the pectoral is entirely free, and not overlapped by the gill-cover apparatus; *it terminates at a considerable distance from the vertical from the origin of the dorsal, equals the length of the head without snout, and is contained once and a third in the distance between its root and that of the ventral.*

The ventral is inserted below the middle of the dorsal.

A specimen, 12 inches long, from the same locality, agrees very well with the one first described; its operculum, however, is as long as high, and the length of the pectoral fin is nearly one-half of the distance between its root and that of the ventral.

An immature specimen, 10 inches long, differs widely from the preceding, its body and its head being much more elongate. The length of the head is more than the height of the body, the former being one-fifth, the latter one-sixth of the total length; the operculum is longer than high, and the height of the head above the mandibular joint is less than the distance between the posterior margin of the orbit and the end of the operculum; the maxillary extends nearly to the vertical from the hind margin of the orbit. The length of the pectoral fin is considerably less than one-half of the distance between its root and that of the ventral.

With regard to the coloration, this species does not differ from *S. Willughbii*; the immature specimen has the sides silvery, and the red of the lower parts is replaced by a slight tinge of orange-colour.

Some of the specimens from Quickjock had the stomach filled with food, which consisted of specimens of small species of *Planorbis* and *Limnæa*, of *Ephemera*, of the larvæ of *Libellula*, and of small fresh-water Crustacea. The number of pyloric appendages is forty-four.

The largest of our *Scotch* specimens is a mature male 11 inches long. It differs from the male from Quickjock in having a more elongate body, the depth of which is one-sixth of the total length. The operculum is as high as long; the pectoral fin terminates at a considerable distance from the vertical from the origin of the dorsal, equals the length of the head without snout, and is contained once and a quarter in the distance between its root and that of the ventral. The *females* do not differ from the males. The *immature specimens* have the same short pectorals which we have found in the young Lap Charr; but the operculum is much less elongate.

The stomach of the Orkney Charr contained large common earth-worms (*Lumbricus*).

We distinguish, therefore, one of the Scotch Charrs by the name of *Salmo alpinus*, which, although not entirely agreeing with a Charr from Lapland described by Linnæus under the same denomination, is nevertheless closely allied to it,—the Scotch variety being considerably smaller in size at the period of first maturity. This Scotch species is found in Lake Helier in Hoy, Orkneys, and very probably in certain other lochs of Scotland*.

c. *Salmo Willughbii*.

This species has been described and figured in the former paper as the Charr of Windermere. A Charr for the knowledge of which I am indebted to Lord Lovat is very closely allied to it. It is found in Loch Bruiach (North Scotland); all the specimens sent are of nearly equal length, between 7 and 8 inches; nevertheless they are mature, and the development of the milt and ova indicates that their spawning-season is the end of October. Lord Lovat writes that “those specimens are smaller in size than usual; but they are the largest we have caught this season.”

This Charr of Loch Bruiach differs but slightly from the typical *S. Willughbii*; it is somewhat more elongate; it has thirteen dorsal rays, the base of the dorsal fin being rather longer than the last dorsal ray. The number of vertebræ is sixty or sixty-one, and that of the pyloric appendages is thirty-five.

d. *Salmo nivalis*. Iceland Charr.

In the original description of *S. Willughbii* I mentioned several specimens of a Charr from Iceland, which were not fit for an accurate examination, owing to the manner in which they had been preserved. Meanwhile I have received from Mr. G. G. Fowler two very fine examples of the same species, which, although young (10 inches long), prove that it is distinct from the other European Charrs. It is probably identical with the dark variety of *S. alpinus*, mentioned by Faber (Fische Islands, p. 169), for which he proposed the name of *S. nivalis*, if some future ichthyologist should point out its distinctive characters.

* The specimens purchased of Mr. Stevens for the collection of the British Museum are from Scotland; but the exact locality whence they have been procured is unknown.

Diagnosis.—Body slightly compressed and elongate; its greatest depth equals the length of the head, and is one-fifth, or somewhat less than one-fifth, of the total length; the length of the head is rather more than one-half of the distance between the snout and the vertical from the origin of the dorsal fin. The maxillary extends beyond the orbit in the adult fish (15–20 inches long). The eye is less than one-half of the interorbital space in the adult fish. The length of the pectoral fin is, in mature and immature specimens, more, or much more, than one-half of the distance of its base from the root of the ventral. Dorsal rays fourteen; the length of the longest ray equals that of the pectoral, or that of the head without the snout; the length of the last ray is two-thirds of the length of the base. 190 transverse series of scales above the lateral line. Vertebrae 62. Teeth of moderate size.

Pyloric appendages 41. Specimens from 10–12 inches long are still immature. The stomach of one contained numerous very small freshwater bivalves.

e. *Salmo Grayii*.

The Earl of Enniskillen has sent several very fine specimens of this species from Lough Melvin for the collection of the British Museum; they were all males, and perfectly like, even in size, those from which I have taken my description. A few of them showed the red of the belly of a deeper hue than the individual figured. A female fish, however, has been discovered among a collection of *Salmonidae* purchased of Mr. Stevens: this specimen does not differ from the males; but the colours have disappeared, the specimen being preserved in spirits. The eggs are of the size of a hemp-seed.

The number of pyloric appendages is thirty-seven; and that of the gill-rakers of the lower branch of the outer branchial arch varies from nine to thirteen.

f. *Salmo Colii*, n. sp. *The Charr of Lough Eske*.

In the former paper on Charrs, I mentioned several Irish specimens, the property of the Museum at Belfast, said to be *perhaps* from Lough Melvin. I then doubted the accuracy of the “habitat,” as those specimens, although allied to the Charr of Lough Melvin, differed in several not unimportant points from the types, and as they evidently belong to a very small species which is mature at a size of 5 inches. Owing to the kind assistance of the Earl of Enniskillen and of Th. Brooke, Esq., I have been able not only to ascertain the exact locality where those specimens are found, but also to determine the characters of this new species (for such has the Charr of Lough Eske proved to be); and I name it after that nobleman, who has taken untiring interest in these researches.

Salmo Colii is not confined to Lough Eske; a specimen procured by R. H. Scott, Esq., from Lough Dan, agrees in every respect with the Charr of Lough Eske. The following description, given strictly in accordance with that of *Salmo Grayii*, will show the distinctive characters on which this species is founded:—

Body slightly compressed and rather elongate, its greatest depth being contained four times and three-fifths or five times in the distance of the snout from the end of the middle caudal rays. The length of the head is one-half of the distance between the snout and the vertical from the origin of the dorsal fin. Head compressed; interorbital space nearly flat, its width being less than twice the diameter of the eye. Jaws of the male of equal length anteriorly; *teeth very small*, four to six in each intermaxillary, fourteen to seventeen in each maxillary. Pectoral shorter than the head, terminating at a considerable distance from the origin of the dorsal and of the ventral. Dorsal rays fourteen. 160 transverse series of scales above the lateral line.

Description of a male and female specimen, 7 $\frac{3}{4}$ inches long.—Head and body slightly compressed, not elevated, the greatest depth being below the origin of the dorsal fin, where it is contained four times and three-fifths (female) or five times (male) in the total length (to the end of the middle caudal rays). The least depth of the tail is considerably less than the length of the base of the dorsal fin. The height of the head above the mandibular joint is more than the distance between the posterior margin of the orbit and the end of the operculum. The top of the profile of the head is scarcely elevated above the margin of the orbit, the diameter of which is one-fifth of the length of the head, somewhat shorter than the snout, and two-thirds of the width of the interorbital space; the latter is but very slightly convex, with a very indistinct ridge along the middle. The nostrils are situated midway between the end of the snout and the orbit. The maxillary extends scarcely to the vertical from the posterior margin of the orbit, and is armed with from thirteen to seventeen very small teeth. All the other teeth are small; four to six in the intermaxillary, fifteen in each mandible, three on the vomer, fifteen on each palatine, and four pairs on the tongue. The sub-operculum forms the hindmost part of the gill-covers, and does not cover the exposed portion of the humerus above the root of the pectoral; its vertical width is one-half of that of the operculum.

D. 14. A. 12. P. 13. V. 9.

The origin of the dorsal fin is a little nearer to the end of the snout than to the root of the caudal; the length of its base is considerably more than that of the last ray, and contained once and a third in that of the fourth ray; the upper margin of the fin is straight. The first ray is nearly half as long as the second, the second and third half as long as the third and fourth; the fifth, sixth, and seventh are the longest, the former simple, and the two latter branched; the last is split to the base, and half as long as the sixth. The distance of the adipous fin from the dorsal is equal to, or rather less than, twice the length of the base of the latter.

The origin of the anal fin is in the middle between the root of the caudal and that of the outer ventral ray; the length of its base is less than that of the dorsal and two-thirds of the length of the fifth ray. The fourth, fifth, and sixth rays are the longest, and form an

acute point; the lower margin of the fin is slightly emarginate. The fourth ray is simple, the fifth branched; the last is split to the base, half as long as the fourth.

Caudal fin forked, one of the middle rays being two-fifths as long as the outer ones, the length of which is less than one-fifth of the total. Lobes pointed.

The base of the pectoral is entirely free, and not overlapped by the gill-cover apparatus; it is shorter than the head, terminating at a considerable distance from the vertical from the origin of the dorsal; its length is one-half, or not much more than one-half, of the distance between its root and that of the ventral.

The ventral is inserted below the tenth and eleventh dorsal rays, its length being four-fifths of that of the pectoral, and two-thirds of that of the head.

Back bluish black; sides silvery, with scattered light salmon-coloured dots; belly reddish; fins black, the anal and the paired fins with a reddish tinge, the anal and the ventrals with a narrow whitish margin.

Number of vertebræ 63.

This is evidently one of the smallest species of this genus; it is mature when it has grown to a size of 5-6 inches, and, according to inquiries made by the Earl of Enniskillen, it never exceeds the length of the specimens described, viz. 7-8 inches. The locality where it is found is Lough Eske, a small lake in the county of Donegal, the circumference of which is not above eight miles. Mr. Brooke, whose family were residents on the shores of that lake for more than two centuries, writes that "Lough Eske (Eske, or Yesk, meaning Fish) was the crater of an extinct volcano, as suggested by Dr. Wilde, of Dublin; a high mountain-range runs close to the north-east shores. In the season, salmon, white trout, and the common lake-trout are in abundance. The Commissioners of Fisheries have decided that the Charr of Lough Eske are the *Salmo alpinus*, thus placing them in the same Act as salmon; so that, except for scientific purposes, we are not permitted to take them after August. Formerly, in the months of October and November the fish were taken in large quantities by the country-people, without any apparent diminution of their numbers. Now, at the permitted season of fishing they remain in such deep waters, the people have not nets sufficiently large to take them. The Charr are not at all like the only 'freshwater Herring' with which I am acquainted, that of Lough Neagh*, the flesh of which is quite white; and the shape of the fish was like Sea-Herring."

Conclusion.

When we recapitulate the results of our examinations contained in this and in the preceding papers, we hope we have shown—

1. That three very distinct species of Charrs are found in Great Britain, namely, *S. Willughbii* in the Lake of Windermere and in Loch Bruiach, *S. cambricus* in Wales, and *S. alpinus* in certain parts of Scotland.

* Mr. Brooke evidently alludes here to the *Coregonus Pollan*.

2. That those three species differ by most constant characters from the *S. Umbla* and *S. Salvelinus* of the Continent; but that *S. alpinus* of Scotland is closely related to the *S. alpinus* of Lapland, differing merely by its smaller size when first attaining to maturity, and by the number of vertebræ.

3. That Iceland is inhabited by a distinct species (*S. nivalis*).

4. That the Charrs of Ireland form a separate group by themselves, distinguished by the feeble development of their dentition; and that the Charr of Lough Melvin (*S. Grayi*) is a distinct species from that of Lough Eske and Lough Dan (*S. Colii*).

In conclusion, I subjoin a synopsis of the species which I have examined up to the present time, observing, however, that this synopsis is given merely for the purpose of showing *a few* of the principal characters by which the *mature* individuals of the different species are distinguished:—

I. *Jaws well developed; teeth of moderate size.*

A. The length of the pectoral fin in the mature fish less than one-half of the distance between the roots of the pectoral and ventral fins.

1. Thirteen dorsal rays. Intermaxillary teeth much stronger than those of the maxillary. L. lat. 185. Lower parts silvery. *S. Umbla*.
2. Fourteen dorsal rays; intermaxillary and maxillary teeth equal in strength. L. lat. 190. Lower parts red. *S. Salvelinus*.

B. The length of the pectoral fin in the mature fish more than, or equal to, one-half of the distance between the roots of the pectoral and ventral fins.

1. The height of the body one-fifth or one-sixth of the total length; the height of the dorsal fin three-fifths or one-half of the length of the head. L. lat. 195–200. *S. alpinus*.
2. The height of the body one-fifth of the total length; the height of the dorsal fin equals the length of the head without snout. L. lat. 190. The gill-cover not overlapping the root of the pectoral. *S. nivalis*.
3. The height of the body one-fifth or one-sixth of the total length; the height of the dorsal fin two-thirds of the length of the head. L. lat. 170. The gill-cover overlapping the root of the pectoral. *S. cambricus*.
4. The height of the body one-fourth of the total length; the height of the dorsal fin equals the length of the head without snout. L. lat. 165. The gill-cover not overlapping the root of the pectoral. *S. Willughbii*.

II. Lower jaw very feeble ; teeth minute.

1. The pectoral extending to, or beyond, the origin of the dorsal fin. *S. Grayi*.
2. The pectoral terminating at a considerable distance from the origin of the dorsal fin. *S. Colii*.

ON *ATHERIS BURTONII*, A NEW SNAKE FROM WEST AFRICA.
BY DR. ALBERT GÜNTHER.

A collection made by Major Burton, H. M. Consul in Fernando Po, during an excursion in the Camaroon country, contained several species of Snakes, namely, *Grayia triangularis*, *Dryiophis Kirtlandii*, a brood of newly-born *Clotho nasicornis**, and, finally, a specimen of a Snake distinguished by its form, scales, and shields, and by a coloration which is almost unique in the whole order of Ophidians. I had named this genus *Pæcilstolus* (Ann. & Mag. Nat. Hist. Jan. 1863); but having since received the last part of 'Proc. Acad. Nat. Sc. Philad. 1862, I find that Mr. Cope has already proposed the generic name of *Atheris* for congeners of our species (p. 337).

ATHERIS.

Head thick, broad, triangular, covered above with strongly-keeled scales; body compressed; tail prehensile. Scales keeled. Subcaudal shields entire.

ATHERIS BURTONII.

The head and neck are rough, in consequence of the keels of the single scales forming prominent spines. The rostral shield is very low, linear, with other scale-like shields above; nine upper labials. Nostril in the middle of a single subquadrangular plate, situated above the first labial; eye surrounded by a ring of subequal scales; chin-shields scale-like, keeled, except the anterior pair, which are smooth; the posterior labial shields of the lower jaw keeled. Scales of the body in nineteen rows. Ventral shields 163; anal entire; subcaudals 58.

Entirely lemon-coloured; some greenish scales are scattered about on the upper surface of the body.

Total length 14 inches; head $\frac{2}{3}$ inch; tail $2\frac{1}{2}$ inches.

NOTE ON *DIEMENNIA SUPERCILIOSA*. BY DR. A. GÜNTHER.

The Proceedings of this Society of last year† contain a very interesting observation of Mr. Kreff, of Sydney, according to which a small banded Snake, which he identifies with *Furina textilis*, Dum. & Bibr., is merely the young of a very large species, the adult of which is of a nearly uniform coloration. Mr. Kreff (who, for the benefit of the collection entrusted to his care, is very anxious to have his specimens identified with the types contained in European col-

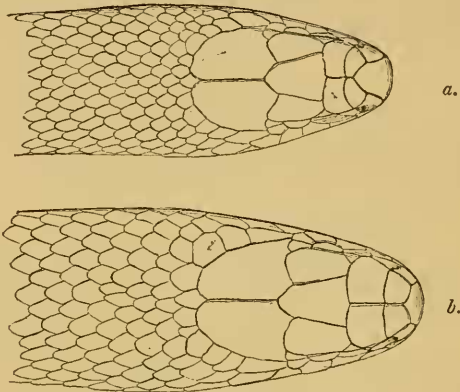
* There is also a specimen, in a very bad state of preservation, which appears to belong to *Neusterophis lævissima* (*Natrix lævissima*, Gthr.).

† 'Annals,' Nov. 1862, p. 393.

lections) has sent us an old and two young examples of this Snake; and having re-examined the species of *Diemennia* and the literature referring to them, I am enabled to settle some points on which doubts have been entertained.

The young specimens, then, found by Mr. Krefft do not belong to *Furina textilis*, Dum. & Bibr., which has three posterior oculars, but to *Diemennia annulata*, described by myself in the 'Catalogue of Colubrine Snakes,' p. 213; and the old individual sent by Mr. Krefft is identical with *Pseudoëlaps superciliosus*, Fisch. M. Jan, of Milan (who says that he has examined the Snakes of the Hamburg Museum), describes the adult Snake under two names, *Pseudoëlaps Sordellii* and *Ps. Kubingii*, the latter being founded on an accidental variety, in which some of the head-shields are confluent.

Mr. Krefft, in a letter addressed to me, alludes to *Pseudonaja nuchalis* as a species which, perhaps, might be identical with an old *Diemennia superciliosa*. These, however, differ *toto cælo*, as may



be seen from the description given by myself (Colubr. Sn. p. 227), and from the figures (*anteà*, p. 1), where fig. *a* represents the head-shields of *Pseudonaja nuchalis*, and fig. *b* those of *Diemennia superciliosa*.

The synonymy of this species, therefore, would be:—

DIEMENNIA SUPERCILIOSA.

a. Adult.

1856. *Pseudoëlaps superciliosus*, Fischer in Abhandl. Geb. Naturwiss. iii. p. 107, taf. 2. fig. 3 (head, not quite correct).

1859. *Pseudoëlaps Sordellii*, Jan in Rev. & Mag. Zool. 1859, pl. C (head).

1859. *Pseudoëlaps Kubingii*, Jan, *l.c.* (founded on an accidental variety).

b. Young.

1858. *Diemansia annulata*, Günth. Colubr. Snak. p. 213.

1862. *Furina textilis*, Krefft, P. Z. S. 1862, p. 149.

Jan. 27, 1863.—G. R. Waterhouse, V.P., in the Chair.

DESCRIPTION OF A NEW SPECIES OF THE GENUS DROMICIA,
DISCOVERED IN THE NEIGHBOURHOOD OF SYDNEY. BY
GERARD KREFFT.

DROMICIA UNICOLOR, sp. nov.

Dentition.—Incisors $\frac{3-3}{1-1}$. Canines $\frac{1-1}{1-1}$. Præmolars $\frac{3-3}{3-3}$. Molars $\frac{3-3}{3-3}$. = 36.

Of the grinders in the upper jaw, two are large and four cuspidate; but the last one is much smaller, of a triangular form, and furnished with three cusps only. The præmolars are three in number, of which the posterior one is large, and furnished with two fangs and two roots; the other two are rudimentary, with flat surfaces; there is an interspace between these teeth and the long canine; of the three incisors the anterior one is the largest.

In the lower jaw there are three true molars, with four cusps to each, but the last or posterior one smaller than the other two; these are preceded by a large two-rooted false molar (which, in one specimen examined, is furnished with one, in the other with two fangs), the anterior præmolars (two) and the canine being small and rudimentary, with flat crowns; the single incisor is very long.

Coloration.—Fur of a uniform mouse-colour, lighter on the sides and beneath, with a blackish patch in front of the eye.

All the hairs are slate-grey at the base, tipped with yellowish at the back and sides, and with grey beneath; longer black hairs, tipped with white, are interspersed, except on the underside of the body. Bristles black to within one-third of the tip, which is white; a few long bristly black hairs before and behind the eye. Tail somewhat longer than the body, prehensile, thin, showing every joint; slightly enlarged at the base, and gradually tapering; covered with a mixture of light-coloured and black hairs; apical portion, about $\frac{1}{2}$ " from the tip, wide beneath.

	inches.
Length from tip to tip	$6\frac{1}{4}$
Tail	$3\frac{1}{4}$
Face, to base of ear	$\frac{7}{8}$
Ear	$\frac{1}{2}$
Arm and hand	$\frac{7}{8}$
Tarsus and toes	$\frac{5}{8}$

This beautiful little creature was captured near St. Leonard's, North Shore, Sydney, feeding upon the blossoms of the *Banksiæ*, and lived a few days in captivity. In its habits it is nocturnal. The tongue of this *Dromicia* is well adapted for sucking the honey from the blossoms of the *Banksiæ* and *Eucalypti*, being furnished with a slight brush at the tip. This species differs from the *D. concinna* of Western Australia in being of a uniform dark colour without the white belly, and having the base of the tail slightly enlarged; it is of about the same size as *D. concinna*.

NOTICE OF A NEW AMERICAN FORM OF MARSUPIAL.

By R. F. TOMES, CORR. MEMB.

Genus HYRACODON, Tomes.

General form somewhat slender. Tail as long as the head and body, tapering evenly to a fine point, Feet long, and furnished with an opposable thumb; nails somewhat long and pointed. Head rather long; muzzle pointed; ears of medium size, ovoid. *Upper incisors*: middle teeth simple, pointed, small, and in a vertical position; the following two large, thick, and short, but having a semi-acute point, which has a very backward direction; the following one, or fourth, similar, but very small; the fifth, or canine, separated from the preceding by a considerable interval, small, conical, acute, and nearly vertical in position; the two succeeding teeth nearly similar. *Lower incisors*: middle teeth long, nearly straight, and horizontal in position, as in the Shrews; the four following teeth more or less conical in form, closely packed together, and sloping forward, small in size, and evenly diminishing from the first to the last; the fifth tooth has a canine-like form, a little more prominent than the preceding, and curved forward; the sixth small, conical, vertical in position, and widely separated from the fifth.

H. FULIGINOSUS, n. s.

Tail sparingly covered with short hairs of a dusky colour, throughout the whole of its length, both above and below; upper surface of the feet sparingly covered with hairs similar to those of the tail; ears nearly naked, and of a dark brown colour; fur on all parts of the body of a deep sooty-brown, scarcely paler on the under parts; all the naked parts brown.

Length of the head and body	3	8
——— of the tail	3	8
——— of the head	1	2

Hab. Ecuador; collected by Mr. Fraser.

ON THE SPECIES OF CRASPEDOCEPHALUS WHICH OCCUR IN THE PROVINCE OF BAHIA, BRAZIL. BY DR. OTHO WUCHERER, CORR. MEMB.

In a former paper, containing the first portion of a list of the Ophidians which I had been able to collect in this province, I abstained from certain remarks on some species of the above genus until I should have collected more ample materials to corroborate them.

In the first place, I was struck by the fact that all the specimens of "Jararaca" which had up to that time come to my notice were very similar, and belonged to one species, *Craspedocephalus atrox*. Having collected more than thirty specimens, I proceeded to examine them more closely for comparison. Dr. Gray, in the 'Catalogue of Viperine Snakes in the Brit. Mus.' 1849, comments on the difficulty

of separating the species of this genus. His diagnoses do not agree exactly with those of Schlegel in his 'Essai,' nor with those of Duméril and Bibron in their 'Erpétologie Générale,' I may therefore be excused if I offer the following remarks on my specimens. In my former paper I stated that I had neither seen *Craspedocephalus lanceolatus* nor *C. brasiliensis*. At the present time I have examined very nearly forty specimens of "Jararaca," all of which, except three, agree sufficiently in every character, and are, according to the descriptions of herpetologists, referable to *C. atrox*. These three specimens show certain slight differences which justify a doubt of their specific identity with the others.

Dr. Gray mentions *C. atrox* as having seven upper labial shields. Schlegel, in his 'Essai,' i. p. 189, and again ii. p. 535, describes this species as having eight labial shields; still this may perhaps be considered a mistake, for in his plate 19 of the above work *C. atrox* is represented as having only seven upper labial shields. Duméril and Bibron make no allusion to this character in *C. atrox*. Now all the specimens of *C. atrox* which I have had occasion to examine have seven upper labial shields. Only one has on one side eight, which must be considered an irregularity.

Dr. Gray describes *C. brasiliensis* as having nine or ten upper labial shields, the hinder ones of which are smaller; Schlegel describes it as having nine; and Duméril and Bibron do not mention the number of labial shields at all.

The three specimens differing from those of *C. atrox* mentioned above have all eight upper labial shields on each side, the last one narrower than the last one in *C. atrox*.

A statement I made in my former paper, that my specimens of *C. atrox* differed from those described by herpetologists in having fewer longitudinal rows of scales, I now take the opportunity to rectify. The number of longitudinal rows of scales in the species of this genus is not always mentioned as a specific character, and indeed it does not appear very serviceable as such. Schlegel's *C. jararaca*, the *C. brasiliensis* of Dr. Gray's catalogue, has twenty-seven rows of scales; of *C. atrox* he says (Essai, ii. p. 536), "On compte quelquefois 29 rangées d'écailles," leaving it perhaps hence to be inferred that it has generally a lesser number, or twenty-seven, like the one just described, which is *C. brasiliensis*. Duméril and Bibron (vii. p. 1509 and p. 1511) give to *C. atrox* from twenty-nine to thirty-two, to *C. brasiliensis* twenty-seven rows. All my specimens of *C. atrox*, with few exceptions, have twenty-seven rows of scales, a few having twenty-five. Of the three specimens differing from them, two have twenty-five and one twenty-three rows of scales.

Schlegel and Duméril and Bibron draw some specific differences from the shape of the head, the former saying (ii. p. 535) that the snout of *C. atrox* is more conical, by which I suppose is meant more rounded, Duméril and Bibron stating that the sharp edge on the anterior part of the head is almost effaced, and does not reach back to the orbits, furthermore that the scales on the anterior part of the head are comparatively much larger than on the posterior part in *C.*

brasiliensis; but all these differences do not appear very striking in Schlegel's excellent figures on plate 19 of the 'Essai.' My three specimens distinct from *C. atrox* would rather agree in these points with the descriptions of *C. brasiliensis* of these authors.

Schlegel points to the larger size of the superciliary and superior labial shields in *C. atrox*, to its larger and more numerous mental shields, to the stronger keel on its scales, showing a strong tendency to take the form of a tubercle, by which I understand that it is higher and shorter, not reaching the tip. Now these characters, if they occurred simultaneously, might very well serve as some of the specific characters; and it does not appear just in Duméril and Bibron to say (vii. p. 1508), "M. Schlegel, dans l'embarras où il s'est trouvé, n'a indiqué que des différences peu importantes, tirées de la forme des écailles dont la carène paraît plus forte; des lames noires allongées, ou de l'étendue relative des plaques surciliaires ainsi que les plaques labiales,"—although they confess their inability to suggest any better characters, and still persist in considering them individuals belonging to two species, having no other basis for their separation than the frequent occurrence of *C. atrox* in Guiana, whilst the other species is never found there.

Comparing my three specimens, which differ from those of *C. atrox* in the last-mentioned respects, and first as regards the size of the superciliary shields, I cannot come to any very precise decision, as they are not full-grown. Comparing with one another old and young specimens of *C. atrox*, I find that not only the superciliary, but all other head-shields are proportionately larger in young individuals, so is the pit in the cheek; and the whole head is flatter, especially the occiput, and more elongate in adult specimens. I compared the three specimens with those of corresponding size of *C. atrox*, but I could not arrive at any decided opinion; and, considering the difference in size of the figures in Schlegel's plate 19, they also do not allow me to draw any safe inference from the relative size of the superciliary shields in each species. Besides, I am not acquainted with the absolute size each species may attain. As regards the size and number of the mental shields, I cannot find any very striking difference; in some specimens of *C. atrox* I have found one, in others two, and even three pairs of chin-shields; in the three specimens which differ in other respects from them, I always found only one pair. The labial shields are certainly smaller in my three specimens which do not agree with *C. atrox*. But more striking still is the shape of the scales and their keel. The three specimens I am inclined to regard as referable to *C. brasiliensis* have narrower scales, their keel lower, narrower, longer, and reaching to their tip. At first glance these specimens have a less hirsute appearance than those of *C. atrox*. In accordance with the narrowness and the smaller number of their scales, their body appears more slender.

I am well aware that the coloration does not afford safe specific characters, except in comparatively few instances; but as all the specimens I referred to *C. atrox* agree so well in this respect, dif-

fering from my three supposed *C. brasilienses*, which again agree among themselves, I may be allowed to state in what one and the other are peculiar. The specimens I refer to *C. atrox* are all greyish yellow or olive, and have along the body irregular brown, black-edged spots with sinuated margins, which occupy about as much space as the ground-colour. In young specimens the colours are generally brighter, and the spots more distinct. Underneath they are all, without exception, chequered with dark grey or black.

The three specimens of supposed *C. brasiliensis* are olive-green; similar brown, black-edged spots, with sinuated margins, occupy their back, but occur at much wider intervals, so that they occupy much less space than the ground-colour; underneath, all three are dirty-yellow, punctulated with black, but not at all chequered.

These differences appear very striking, but I refrain from attaching undue weight to them. Schlegel describes some specimens of *C. brasiliensis* with "larges taches carrées" (Essai, ii. p. 533). Duméril and Bibron are not explicit as regards the coloration of *C. brasiliensis*.

In Prof. Jan's 'Prodrome d'une iconographie descriptive des Ophidiens,' published in 1859, I find *Trigonocephalus Newwiedi*, which is synonymous with *C. atrox*, enumerated as a distinct species. I also find that Duméril and Bibron consider specimens with a white tip to the tail as a variety; I may therefore be allowed to make the following remarks. Seven of my specimens of *C. atrox* are quite young, their total length ranging from 0·333 to 0·382; in all the tip of the tail is white. Besides these, I have seen many other small specimens, which always showed the same peculiarity. In two specimens of 0·620 and 0·530 total length, which may be considered half-grown, the tip of the tail is lighter-coloured than the rest of the body, showing the transition to the black colour in the tail of adults. From this I think it reasonable to infer that the difference in the colour of the tip of the tail in individuals of *C. atrox* depends on their age, and does not constitute a variety, much less a species. The Brazilians, however, consider small individuals as a distinct species, which they call "Caisacca." Of the young of *C. brasiliensis* Schlegel states expressly (Essai, ii. p. 533), "Les petits offrent le bout de la queue blanc."

The largest of my three supposed specimens of *C. brasiliensis* has a total length of 0·872, and may be considered therefore about half-grown; the tip of its tail is lighter-coloured than the body; underneath to a greater extent, and above at the extreme tip it is quite white. In one of the other two specimens the tip of the tail is lighter-coloured, in the other white.

According to the statement of Schlegel, the iris of *C. brasiliensis* is dark red; he does not mention how the iris of *C. atrox* is coloured. In many live specimens of the latter species which I have seen, I always found it of a dark grey. I never saw a live specimen of a snake corresponding to my supposed specimens of *C. brasiliensis*. In these the colour of the iris is not preserved.

As to *C. lanceolatus*, I very much doubt whether it occurs in Brazil at all.

Trigonocephalus Landsbergii, Schl., *Bothrops Castelnaudi*, and *Bothrops alternans*, D. & B., have not yet come under my notice.

Of *Craspedocephalus bilineatus* I have seen eight specimens—seven from the vicinity of Villa Vicosa (where the Prince of Wied, who first described the species), found his specimen, and one of unknown origin.

I had previously observed that some Brazilian species of Snakes (as *Spilotes variabilis* and *S. pæcilostoma*, *Coryphodon pantherinus*, *Xenodon colubrinus*, &c.) have the habit of striking the ground rapidly with their tail when irritated; I had lately occasion to notice the same peculiarity in a large specimen of *Craspedocephalus atrox*.

MISCELLANEOUS.

Additional Observations on Chelymys dentata.

By Dr. J. E. GRAY, F.R.S. &c.

IN the previous Number of the 'Annals' (p. 98), I described a new species of *Chelymys*, from the Upper Victoria River, brought to England by my late friend Mr. Elsey, and not by Mr. Macgillivray, as inadvertently stated in that paper.

When I made that description, I had forgotten that we had also an adult specimen, brought from the same locality at the same time, which is doubtless the adult of this species; and this specimen proves that the dentated form of the margin is only a peculiarity of the younger state of the species; and therefore the specific name is not one that I should have chosen if I had had the adult form of the species before me when I selected it. But as the margin is not dentated in the young of the other species, it is still characteristic. The species is easily known from the other, both in its adult and young state, by the absence of the nuchal plate.

The adult shell is oblong-ovate, solid, and high; the back is worn smooth, and the margin is entire, the edge over the legs being rather expanded, and the hinder part over the tail rather inflexed; the vertebral plates are very long, slender, with straight parallel sides, nearly twice as long as they are wide; the hinder part of the fourth shield is rather narrowed. The sternum is narrow, rounded in front, and with a deep semicircular notch behind, high on the sides. The underside is black, with a few unequal-sized yellow blotches. The length is 13 inches; width over the back $10\frac{1}{2}$ inches.

On a New Genus of Humming-Birds.

By JOHN GOULD, F.R.S.

To the Editors of the Annals and Magazine of Natural History.

GENTLEMEN,—I send for insertion in your next Number a description of a new and very singular Humming-Bird which I have lately received from Ecuador. Not only does it differ specifically from every other with which I am acquainted, but it also differs in its structure from every form comprised in the great family of Trochilidæ. I therefore propose to call it